

Appendix A - Examples of EE/RE projects that could qualify for an award of allowances

Energy Efficiency (EE) Examples

Lewis and Clark State Office Building (DNR Green Building)

Energy savings per Ozone Season: 732,017 kWh (compared to “typical Missouri” building)

NOx pounds: 1,098

Allowances: 1

New Jersey ESCO

Who: SYCOM, California-based ESCO with projects nationally

Project: Aggregated EE projects for SYCOM’s New Jersey clients

- ◆ Clients include municipal buildings, colleges, K-12 schools, industry, warehouses, and other.
- ◆ Installations primarily lighting and motor upgrades (VSD & VFD)

Energy savings per Ozone Season: 51.4 million kWh

NOx pounds: 77,107

Allowances: 39

EPA EE Example: Office lighting retrofit

Who: financial institution with multiple locations

Project: lighting retrofits at retail branches, administrative office buildings and data centers

- ◆ Replace 4,500 176-wattage lighting fixtures with energy efficient lighting that uses 70 watts
- ◆ Install several thousand energy efficient T8s and electronic ballasts
- ◆ Install lighting occupancy sensors programmed to power down during non-use periods

Energy savings per Ozone Season: 2.8 million kWh

NOx pounds: 4,200

Allowances: 2

EPA EE Example: Commercial building envelope retrofit

Who: retailer with multiple locations

Project: completes a variety of energy efficient retrofits at a number of different store locations

- ◆ Lighting upgrades at 170 stores, including installation of compact fluorescent lighting
- ◆ Full building envelope upgrades at 40 stores, such as energy management systems, energy efficient HVAC and windows, and LED exit signs
- ◆ Downsize their cooling systems from the original (and oversized) systems by installing smaller pumps and installing low-e glass windows to cut down on the heating and cooling load

Energy savings per Ozone Season: 4 million kWh

NOx pounds: 6,000

Allowances: 3

EPA EE Example: New residential construction

Who: developer of energy-efficient homes

Project: several subdivisions of homes (4,500 homes)

- ◆ All meet the national model energy code for insulation and equipment

- ◆ 80 percent of the homes, upgrades the windows, seals and insulates the ducts, seals the homes against infiltration of outside air, improves the water heater efficiency, and installs programmable thermostats, resulting in 30 percent savings over typical house meeting the model energy code
- ◆ 20 percent of homes also have high-efficiency gas furnace and water heater, energy efficient lighting (T8s, compact fluorescent lights, photocell/motion detectors on outside lighting) and energy efficient appliances (including Energy Star refrigerators, horizontal-axis washers and smart-logic dishwashers)

Energy savings per Ozone Season: 1.4 million kWh

NOx pounds: 2,100

Allowances: 1

EPA EE Example: Industrial plant retrofit

Who: industrial plant that uses electricity for process-related equipment, air conditioning and lighting.

Project: energy efficiency retrofits

- ◆ Replace five chillers with a single unit sized to match the system load
- ◆ Replace lamps and ballasts
- ◆ Install reflectors in fluorescent fixtures
- ◆ Reduce lighting operating hours for unoccupied areas
- ◆ Time clock controller to reduce the operating hours of hot water circulation pumps
- ◆ Insulate hot water lines
- ◆ Replace 14 motors with high-efficiency replacements
- ◆ Repair leaks in the compressed air line

Energy savings: 2.4 million kWh

NOx pounds: 3,600

Allowances: 2

CHP Example

Ohio EE Example: CHP at athletic facility

Who: athletic facility

Project: two 60-kilowatt microturbines

- ◆ Operate full time during the ozone season
- ◆ Waste heat used to produce hot water for the building and to heat two swimming pools
- ◆ Average rated energy efficiency during the ozone season is 60%

During full load, the system emits 0.4 lbs. NOx/MWh.

NOx pounds: not provided in Ohio's draft guidance

Renewable Generation Examples

Ohio RE Example: Wind turbines

Who: wind development company

Project: 10-turbine wind farm, each turbine generates 3,500 MWh during the compliance period

Conventional generation displaced during ozone season: 35,000 MWh

NOx pounds – 52,500

Allowances: 26

Ohio RE Example: Landfill methane

Who: landfill

Project: use captured methane to fuel two internal combustion engines each powering 800 kW generator Conventional generation displaced during ozone season: 5,875,200 kWh (operate continuously, distribution to grid)

NOx pounds: 8,812

Allowances: 4

Notes on methodology and sources

- ◆ Pounds of NOx are calculated assuming .0015 pounds NOx per kWh
- ◆ Allowances are calculated as pounds NOx / 2000, rounded to nearest integer

Sources for these examples:

- ◆ Green Building data: Rumsey Engineers, Design Development Energy Report, 2001 Rev 1.1
- ◆ New Jersey ECSO: SYCOM “NOx Budget Incentive Allowance Claim” 2/28/02
- ◆ EPA examples: *Creating An Energy Efficiency and Renewable Energy Set-Aside in the NOx Budget Trading Program: Designing the Administrative and Quantitative Elements*, pp. 12-13
- ◆ Ohio EPA examples: *Energy Efficiency/ Renewable Energy and Innovative Technology Set-Asides in Ohio*, Draft, 10/08/04.